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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,134	02/06/2006	Masahiko Igarashi	025416-00026	4553
4372 7590 06/26/2008 ARENT FOX LLP 1050 CONNECTICUT AVENUE, N.W. SUITE 400 WASHINGTON, DC 20036				
EXAMINER GARCIA, ERNESTO				
ART UNIT 3679		PAPER NUMBER		
NOTIFICATION DATE 06/26/2008		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DCIPDocket@arentfox.com
IPMatters@arentfox.com
Patent_Mail@arentfox.com

Office Action Summary

Application No.

10/567,134

Applicant(s)

IGARASHI ET AL.

Examiner

ERNESTO GARCIA

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
4a) Of the above claim(s) 7-14 and 17-19 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-6, 15 and 16 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 06 February 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :2/6/06; 9/18/06; 11/21/06; 12/12/07.

DETAILED ACTION

Election of Species

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

- | | |
|---------------------|------------------------------|
| I. Figures 1-14. | II. Figures 15-22. |
| III. Figures 23-32. | IV. Figures 33-36 and 39-45. |
| V. Figure 37. | VI. Figure 38. |
- Figure 46 is directed towards a process.

Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims

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are added after the election, applicant must indicate which are readable upon the elected species. See MPEP § 809.02(a).

The claims are deemed to correspond to the species listed above in the following manner:

Claims 1-6 and 16 correspond to species I.

Claims 7-8 correspond to species II.

Claims 9-11 correspond to species III.

Claim 12 corresponds to species IV.

Claim 13 corresponds to species V.

Claim 14 corresponds to species VI.

The following claim(s) are generic: claims 1 and 15 appear generic.

The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons:

The recitation "said valley of said shaft tooth section has an arcuate region having a predetermined radius of curvature and extending toward said hub tooth section" in claim 7, lines 1-3, precludes species I. The recitation "said valley of said shaft tooth section has a tapered region having a diameter progressively increasing toward the hub tooth section" in claim 9, lines 1-3, precludes species IV. The recitation "said peak of said hub tooth section has a tapered region having a diameter progressively increasing away from said shaft tooth section" in claim 12, lines 2-3, precludes species V and VI. The recitation "said peak of said hub tooth section has an arcuate region having a predetermined radius of curvature and retracted away from said shaft tooth section" in claim 13, lines 2-3, precludes species I and IV. The recitation "said hub tooth section is straight and has a constant tooth thickness, said hub tooth section having a peak and a valley which have a constant inside diameter in the axial direction of the shaft from the end toward said shaft shank" in claim 17, lines 8-11 precludes species I.

During a telephone conversation with Mr. Richard J. Berman on June 19, 2008, a provisional election was made without traverse to prosecute the invention of species I, claims 1-6. Affirmation of this election must be made by applicant in replying to this

Office action. Claims 7-14 and 17-19 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Claims 15 and 16 appear to read upon the elected species despite that Mr. Berman indicated that these were not readable upon the elected species.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

The drawings are objected to because reference characters "10" in Figure 1, "100" in Figure 15, "23" in Figure 23, and "300" in Figure 33 should not be underlined and should be depicted with an arrow.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "14" has been used to designate both a hub with a first configuration (Figure 1), a hub with a second configuration (Figure 15), a hub with a third configuration (Figure 23), and a hub with fourth configuration (Figure 33).

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "12" has been used to designate a shaft with a first configuration (Figure 1), a shaft with a second configuration (Figure 15), a hub with a third configuration (Figure 23), and a shaft with a fourth configuration (Figure 33).

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "22a" has been used to designate a crowned peak with a first configuration (Figures 3, 4, 16, 17, 24, and 34-37), and crowned peak with a second configuration (Figures 5, 25, and 38).

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "22b" has been used to designate a valley with a first configuration (Figure 3), a valley with a second configuration (more slanted; Figures 4 and 5), a valley with a third configuration (Figures 16 and 17), a valley with a fourth configuration (Figures 24 and 25), a valley with a fifth configuration (Figure 34), a valley with sixth configuration (more slanted; Figure 35-38).

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "28" has been used to designate a hub tooth section with a first configuration (Figure 3), a hub tooth section with a second configuration (Figures 4 and 5), a hub tooth section hub with a third configuration (Figures 16 and 17), a hub tooth section with a fourth configuration (Figures 24 and 25), a hub tooth section

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(Figures 34, 35, and 38), and another hub tooth section with a fifth configuration (Figures 36 and 37).

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "22" has been used to designate a shaft tooth section with a first configuration (Figures 11, 18, and 27) and another shaft tooth section with a second configuration (Figures 12, 19, and 28).

The drawings are objected to because reference characters "P0", "a", "b", and "c" are missing the lead lines. Further, the dimensions throughout the figures are inconsistent. Applicants should consider using the same dimension character where it appears the same otherwise new one should be introduced. In other words, different parts must be designated with different reference characters.

Figure 2B contain extraneous text and should be deleted. Further, it is unclear why the loads a-c overlap and drawn with circles. Shouldn't these be depicted with regions?

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure

number of an amended drawing should not be labeled as "amended". If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 6 is objected to because of the following informalities:

regarding claim 6, --the-- should be inserted before "crowned" in line 5.

Appropriate correction is required. For purposes of examining the instant invention, the examiner has assumed these corrections have been made.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6, 15, and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the metes and bounds of the claim is unclear. In particular, is unclear what the mechanism is comprised of? Further, if the shaft and the hub are part of the mechanism, how does the mechanism intend to transmit torque between the shaft and the hub? Further, the recitation "said peak and said valley" in line 11 makes unclear whether that is the peak and the valley of the shaft tooth section or that of the hub tooth section.

Regarding claim 5, the metes and bounds of the claim is unclear. In particular, is the load being sold with the mechanism? How does one determine whether one having the same mechanism has the load thus providing the different main load transmitting regions? Note that patentability is based on the structural differences between the prior art and the claimed invention and not what the mechanism does or performs.

Regarding claim 6, it is unclear how one determines the magnitude when the loads overlap?

Regarding claims 2-4, 15, and 16, the claims depend from claim 1 and therefore are indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5, 6, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Beigang, 6,142,033.

Regarding claim 1, Beigang discloses, in Figures 1 and 2, a mechanism comprising a shaft **1** and a hub **2**. The hub **2** is disposed around the shaft **1** while holding a shaft tooth section **5** formed on the shaft **1**. The hub **2** has a hub tooth section **7** in engagement with the shaft tooth section **5**. The shaft tooth section **5** has a crowned peak having a varying tooth thickness and a valley **A2** having an outside diameter varying from an end thereof toward a shaft shank of the shaft **1**. The hub tooth section **7** has a straight peak **A4** and a valley **A5**. The straight peak **A4** has a constant tooth thickness and an inside diameter varying from an end thereof toward the shaft shank. The valley **A5** of the hub tooth section **5** has a constant inside diameter in the axial direction of the shaft **1**.

Regarding claim 2, a changing point of the outside diameter of the valley **A2** of the shaft tooth section **5** and a changing point of the inside diameter of the peak **A4** of

the hub tooth section **7** are set in respective positions which are offset from each other in the axial direction of the shaft **1** (see towards the left side of Figure 1 which is the front of the joint).

Regarding claim 5, different main load transmitting regions are provided depending on a magnitude of a load applied to an area where the shaft tooth section and the hub tooth section mesh with each other.

Regarding claim 6, the magnitude of the load selectively represents a low load, a medium load, and a high load, and the main load transmitting regions are established successively in a direction from a crowning top of the crowned peak towards the shaft shank.

Regarding claim 15, the peak of the shaft tooth section has an outside diameter which varies in the axial direction of the shaft **1**.

Claims 1, 3, 4, 15, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Stall et al., 5,779,551.

Regarding claim 1, Stall et al. disclose, in Figure 1, a mechanism comprising a shaft **1** and a hub **3**. The hub **3** is disposed around the shaft **1** while holding a shaft tooth section **6** formed on the shaft **1**. The hub **3** has a hub tooth section **14** in engagement with the shaft tooth section **6**. The shaft tooth section **6** has a crowned

peak having a varying tooth thickness and a valley **7** having an outside diameter varying from an end thereof toward a shaft shank **5** of the shaft **1**. The hub tooth section **14** has a straight peak and a valley. The straight peak has a constant tooth thickness and an inside diameter varying from an end thereof toward the shaft shank. The valley of the hub tooth section has a constant inside diameter in the axial direction of the shaft **1**.

Regarding claim 3, the valley of the shaft tooth section has a first step region (at **7**) raised toward the hub tooth section. The peak of the hub tooth section has a second step region retracted away from the shaft tooth section (near **4**). A starting point of the first step region and a starting point of the second step region are set in respective positions which are offset from each other by a predetermined distance.

Regarding claim 4, the first step region of the shaft tooth section has a tilt angle set to a value ranging from 5 degrees to 45 degrees.

Regarding claim 15, the peak of the shaft tooth section has an outside diameter which varies in the axial direction of the shaft **1**.

Regarding claim 16, the peak of the shaft tooth section **6** has an outside diameter which gradually decreases toward the shaft shank **5**.

Conclusion

The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patent, SU-398782, shows a similar a crown peak with varying tooth thickness.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ernesto Garcia whose telephone number is 571-272-7083. The examiner can normally be reached from 9:30AM-6:00PM. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached at 571-272-7087.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/E. G./

Examiner, Art Unit 3679

June 25, 2008

Attachment: one marked-up page of Beigang, 6,142,033

/Daniel P. Stodola/
Supervisory Patent Examiner, Art Unit 3679

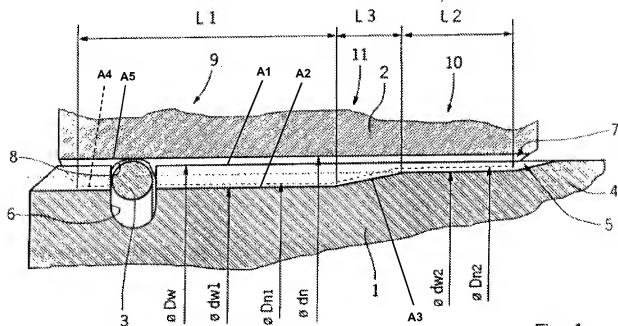


Fig. 1